

Appl. No. 09/872,052 Attorney Docket No. 1810A-045 (81841.0192)  
 Amdt. Dated December 14, 2004 Customer No.: 26021  
 Reply to Office Action of September 14, 2004

REMARKS/ARGUMENTS:

Claim 62 is amended. Claim 72 was withdrawn from consideration in response to the restriction requirement dated August 19, 2002 and is now canceled. Claims 55-71 are pending in the application. Reexamination and reconsideration of the application, as amended, are respectfully requested.

CLAIM OBJECTIONS:

The Examiner states, "Claim 62 is objected to because of the following informalities: 'acyclic' in line 2, should be acrylic (based on Applicant's disclosure on page 8, line 7, of the specification.) Appropriate correction is required." In response, the Applicant corrected this typographical error in the manner suggested by the Examiner. Withdrawal of this objection is thus respectfully requested.

CLAIM REJECTIONS UNDER 35 U.S.C. §102:

Claims 55-61 and 63-71 stand rejected under 35 U.S.C. §102(e) as being anticipated by Obremski et al. (U.S. Patent No. 6,110,749). The Applicant respectfully traverses this rejection.

Claim 55 is as follows:

A device comprising a plurality of unmodified biopolymer and a solid support, wherein the solid support has at least one surface comprising pendant acyl fluoride functionalities, and wherein an unmodified end of the biopolymer is attached to the solid support by reaction with the pendant acyl fluoride functionalities, in the absence of a spacer arm.

Applicant respectfully submits that Obremski cannot anticipate claim 55, because Obremski fails to teach a "device comprising a plurality of unmodified biopolymer ... wherein an unmodified end of the biopolymer is attached to the solid

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support by reaction with the pendant acyl fluoride functionalities, in the absence of a spacer arm."

Obremski states, "A short sequence oligonucleotide complementary to the target analyte was covalently coupled to the waveguide using acyl fluoride coupling, and served as the probe." (Obremski, column 16, line 65-column 17, line 1). The Examiner states,

"that in the absence of a teaching that the biopolymer must be modified in order to be attached to the solid support, one of ordinary skill in the art would not modify the biopolymer. Obremski does not disclose that the biopolymer must be modified in order to be attached to the solid support." (Office Action, page 6).

The Applicant respectfully disagrees. The Applicant respectfully submits that the oligonucleotides used by Obremski were modified. In order to support this assertion, the Applicant submits herewith a Declaration under 37 C.F.R. § 1.132 of inventor Robert S. Matson. Consideration of the Declaration of Robert S. Matson is respectfully requested.

This Declaration provides evidence that the Obremski's oligonucleotides were modified. The inventor Robert S. Matson provided Obremski with the oligonucleotides that were covalently coupled to the waveguide using acyl fluoride coupling (Obremski, column 16, line 65-column 17, line 1). In his Declaration, Matson confirms that those oligonucleotides were amino-modified. In addition, Matson also confirms that unmodified small oligonucleotides were found to be inefficiently when immobilized to most solid supports relative to amino-modified oligonucleotides.

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Obremski cannot make instant claim 55 obvious. Obremski has no teaching or suggestion whatsoever of attaching an unmodified end of a biopolymer directly to the acyl fluoride functional groups of a solid support.

Prior to the present invention, it was generally understood in the art that the attachment of biopolymers via available terminal amino groups may lead to inefficient and unstable attachment or to reduced activity of the attached biomolecule. Since biopolymers contact supports in a random orientation, the terminal attachment of biopolymers may suffer from low stability and efficiency.

Because of the possible low attachment efficiency and reduction in biomolecule activity of terminal attachments via naturally present amino groups, this methodology has been abandoned years ago in favor of using post-modified or derivatized biomolecules. In view of the state of the art discussed above, prior to the present invention, one skilled in the art could not have predicted with certainty that biopolymers could be efficiently immobilized directly on substrates without modification and without the use of linkers. This invention unexpectedly demonstrates that such attachment is possible.

Thus, in the absence of data to the contrary, a person of ordinary skill in the art would assume that a modification of the oligonucleotide (e.g., 5' amino-modification) took place before the covalent attachment was performed, since this is in keeping with the prior art before the present invention. (Applicant's specification, at page 1, lines 23-30).

In light of the foregoing, Applicant respectfully submits that Obremski could not have anticipated or rendered obvious claim 55, because Obremski fails to teach or suggest each and every claim limitation. Claims 56-61 and 63-71 depend from claim 55 and cannot be anticipated or rendered obvious for at least the same reasons as claim 55. Withdrawal of these rejections is thus respectfully requested.

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CLAIM REJECTIONS UNDER 35 U.S.C. §103:

Claim 62 is rejected under 35 U.S.C. 103(a) as being unpatentable over Obremski et al., 6,110,749 in view of Lindall, 5,470,307.

Claim 62 depends from claim 55 and therefore, cannot be rendered obvious over Obremski for the same reasons discussed above. Lindall cannot remedy the defect of Obremski and is not relied upon by the Examiner for such. Instead, the Examiner cites Lindall for teaching a polymer support that is made of carboxyl-modified polypropylene and has proteins or nucleotides coupled to it. Lindall fails to teach or suggest using acyl fluoride groups for any of the couplings.

In light of the foregoing, Applicant respectfully submits that the cited references could not have made claim 62 obvious, because the combination of references fails to teach or suggest each and every claim limitation. Withdrawal of this rejection is thus respectfully requested.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.


If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (213) 337-6851 to discuss the steps necessary for placing the application in condition for allowance.

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If there are any fees due in connection with the filing of this response, please  
charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,  
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Date: December 14, 2004

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